

MONTANA AERONAUTICS COMMISSION



Volume 14, No. 4

May, 1963

DIRECTOR'S COLUMN



Aviation Rates

For the benefit of the aviation industry, I will review coverage rates for employers with full-time personnel on their payroll under Plan 3 of the laws governing the Industrial Accident Board and the rates charged for Workmen's Compensation insurance.

Plan 1 of the Act is for those employers who are self-insured

by agreement with the Industrial Accident Board. Plan 2 is for those employers who elect to have a major insurance company (which is authorized to do business within the State of Montana) cover their liability for them by adequate policies. Plan 3 is for those employers who choose to participate in the State Plan whereby their contributions are accumulated in the Industrial Accident's Fund maintained by the State.

In regard to Montana, the National Council on Compensation Insurance has qualified as an advisory organization and not as a rating organization. The rates shown have been calculated by the use of normal rate-making

methods but they have not been filed with the Montana Insurance Department by the National Council. So far as the National Council is concerned, they are issued on an advisory basis only and were effective September 1, 1962.

The effective date of the Montana Fund Plan 3 rate was August 1, 1962.

All rates are per \$100 of earned salary.

MPA REPORTS STATE

As you know, each year the military services celebrate Armed Forces Day to provide the American public the opportunity to view and inspect the preparedness of their Armed Forces.

Since members of our organization have shown an active interest in Malmstrom Air Force Base and its flight facilities, Lt. Col. Harold Neufeld, Base Director of Operations, has invited the entire Montana Pilots Association to "fly in" for the day.

Approval of this "fly in" has been obtained for Armed Forces Day, May 18, 1963. All pilots landing at Malmstrom will be required to sign an AF Form 180, which is a Hold Harmless Agreement and releases the Air Force from all liabilities in connection with civil aircraft use of Air Force Installations.

There will be limited eating fa-

RATES CHARGEABLE FOR WORKMEN'S COMPENSATION

	Conference Rate	Montana Rate	Code
1. Scheduled Transports	.91	1.00	7405
2. Mapping & Photography N.O.C.	1.11	4.50	7422
3. In testing unmanned drones—applies to all ground personnel	NO CLASSIFICATION		
4. Cropdusters & Fire-fighters	8.11	20.00	7420
5. Public Exhibitions and/or Stunt flying	8.11	20.00	
6. Transporting of Personnel in conduct of employer's business	1.11	4.50	7421
7. Irregular (Non-scheduled)	1.11	4.50	7431
8. Sales, Service, Charter, Taxi, Student			7422
9. Helicopters, other than scheduled transports	1.11	4.50	7425
10. Flight Testing by manufacturer of aircraft (Not Published)		20.00	7430

Official Monthly Publication
of the
**MONTANA AERONAUTICS
COMMISSION**

Box 1698
Helena, Montana

Tim Babcock, Governor
Charles A. Lynch, Director

E. B. Cogswell, Chairman
Herb Jungemann, Vice-Chairman
Gordon R. Hickman, Secretary
Clarence R. Anthony, Member
Walter Hope, Member
Carl (Bill) Bell, Member
Al Newby, Member

R. J. (Dick) Munroe, Editor

ARTCRAFT PRINTERS

cilities consisting of hot dogs, hamburgers, etc., on the flight line. Emergency service **ONLY** will be available to civil aircraft.

It is suggested that all pilots brief themselves on the Malmstrom area and know that the traffic is left on Runway 20 and right on Runway 02.

The Malmstrom Control tower will have two civilian frequencies in addition to normal military frequencies for the Armed Forces Day "fly in". The tower will be able to transmit and receive on 118.9 and will receive only on 122.5. The primary military tower frequency is 126.2.

"Fly ins" will be allowed from 1100 to 1300 and from 1500 to 1600. The Open House will be over at 1700. Military fly overs of high speed jets are scheduled between 1330 and 1430. Any pilots flying in the area during this time should contact either Malmstrom tower or Great Falls tower for advisory service. It is suggested that all pilots make full use of the tower when arriving and departing, as the traffic could get heavy between 1100 and 1300 and 1600 and 1700.

We are fortunate that Lt. Col. Neufeld has set this up for us, so let's show him our gratitude with a real good turn out.

Sincerely,

Herb Sammons, President

MONTANA AIR TOUR

Plans are shaping up well for the M. P. A. MONTANA AIR TOUR, scheduled June 21, 22 and 23. Proposed is a 3-day, 550 miles

"continuous Fly-In" with the idea being to stimulate interest in Montana Aviation and to give pilots and their families an excuse to enjoy some of our beautiful Montana scenery, which can best be seen by airplane.

The Chinook Hangar has invited us to get together in Chinook, Friday evening, June 21st as the starting point of the Air Tour. Since the maximum number of daylight hours, by coincidence, falls on June 21st, it should be easy for pilots who can't break away from work until 5 or 6 p.m. on Friday to still drive their airplanes to Chinook for an evening of good fellowship. Tentative plans for the evening include an informal dinner and a relaxing "let's get acquainted" type evening.

Saturday morning breakfast is scheduled to be a good old-fashioned Pancake Fry right on field at the Havre Airport. The chores of cooking and dishwashing on this are to be credited to the local Havre Hangar. Those who can't get away for the Friday evening fun can of course join the group for Saturday breakfast at Havre.

From Havre, the tour is scheduled to stop by at the Great Falls airport for a short coffee break. Great Falls President Johnson has made the suggestion that this might be considered a "rest stop" for those who earlier enjoyed a 3rd or 4th cup of coffee at Havre.

Next stop is to be for lunch at Bozeman. While all details haven't been worked out on this, we have secured a promise from Al Newby to treat the crowd to a one-man Aerobatic Show in his World War II type hot-rod.

After Bozeman, the Tour heads west on to Missoula. The hospitable Elks Club at Missoula is to be the center of activity for Saturday night, which promises to be a complete evening starting with a No-Host social hour, followed by fine Elks Club dinner and an evening of dancing, and social-izing with the Missoula gang.

For those who stop over Saturday night at the Florence Hotel in Missoula, our State President Herb Sammons has volunteered to organize one of Herb's famous

Wake-Up Committees. This committee will undoubtedly be made up of a sufficient number of noisy extroverts to insure that all known pilots are awake and Tomato-juiced prior to take-off time.

The Polson Chamber of Commerce has kindly offered to host a Brunch-Stop at the Polson Airport from about 10:30 to 11:30 Sunday morning. After Brunch, the Tour is to continue along scenic Flathead Lake and north to the Quarter Circle MP dude ranch on the North Fork of the Flathead River. A Sunday Barbeque is in the works for this stop, along with good fishing, horseback riding, and just plain sight seeing. The Air Tour will be using the all new M. A. C. runway at this last stop, which actually is inside Glacier Park.

The Air Tour will end Sunday afternoon at the Quarter Circle MP ranch, following the barbeque activities.

One feature of the Air Tour is to be that pilots can join the tour or leave when desired. Those who can participate on Sunday only will be welcome. An advance registration is planned, so that adequate arrangements can be made at the various stops along the route of the tour. Additional news will be sent out as details are completed, and it is planned to set up an advance registration desk at the Helena convention.

More information will be coming soon, but in the meantime, be sure to mark your calendar for the M. P. A. MONTANA AIR TOUR on June 21, 22 and 23rd.

Hope to see everyone there!

Russ Lukens, Vice-President

Aviation Education Notebook

Mary Jo Janey

There are two areas in the high school curriculum where aviation can be taught: vocational and academic.

In the academic courses such as English, history, math and the sciences, teachers are responsible for one or two subjects, in comparison with elementary teachers who must teach all subjects to one class. Study of each course

can be made in more depth, with emphasis on acquiring more knowledge and deeper understanding rather than on strengthening basic skills.

In English classes we find opportunities for using aviation in oral and written reports, letter writing, speeches and debates, research papers, library use, independent and guided reading, and book reports. High school age students are more easily motivated to practice oral and written language usage if they see a need and feel an interest in the topics being used. Aviation developments from earliest to latest times have produced much fine literature, from the myths of ancient civilizations to Tennyson, from St. Exupery to Ann Morrow Lindberg. Some excellent bibliographies are available to help English classes get started on such a unit.

In history, ancient as well as modern, and in geography, development of the world and man has followed along with man's ease of mobility. Certainly the history of aviation cannot be ignored if a complete picture of man's progress is desired. When the air ocean became the medium of travel, touching every point on earth, we find uncivilized areas jumping from the stone age to the air age, bypassing the tedious development of surface travel. New frontiers are now in the air and space.

In math and the sciences much aviation is already being included. Time-distance problems, fuel consumption, navigational computation, theory of aerodynamics, meteorology, ballistics—these and many more topics are examples.

In vocational areas, Montana has made some strides. There has been for many years the Helena Aeronautical Trades School connected with the Helena High School. Courses are offered which lead to an Aircraft and Powerplant mechanic's license. The school has an airplane and instructor, offering up to ten hours dual instruction. Helena also has an Aviation Education course open to any high school student. Townsend High School has an Aviation Education Course in con-

nection with their Civil Air Patrol Cadet Squadron. Cut Bank High School has an aeronautics course.

Efforts are now being made to encourage more high schools to offer aviation courses of a ground school type. Glasgow High School ran their first course of this type this year. It is possible that three or four more high schools will offer this course next year. The courses are built around the audio-visual ground school courses for private pilots. The major drawback in getting more schools to offer these courses is the lack of qualified teachers, a problem which we are trying to overcome.

Sometime in the future, it is hoped that flight training courses, similar to present driver training programs, will be initiated. It is something we can all think about.

Accident Prevention



BERNARD A. GEIER

FAA Safety Agent—Billings

In the last article, I discussed cold weather operations. Since we hope that winter is over, it is time to think about the problems of Spring and Summer.

Spring always brings showers of snow and rain and with them, reduced visibilities to Montana. Each year there are a few who try to fly through, rather than around, these showers. Many times it is so heavy in the shower that the pilot loses visual reference and an accident results.

The shower activity is also accompanied by high moisture in a normally dry area. As a result, there are more cases of carburetor icing at this time of year. Review icing problems with your instructor or flight operator.

Many times the rain from these

spring showers are in the form of freezing rain. This may force you to land on soft or muddy fields due to the loss in lift from the ice formations on the wings. Whenever possible, avoid shower areas.

Now, before summer gets here, think a little about summer flying problems. Review the aircraft manual of your ship to see the effect of high altitude and/or high temperatures on take off distances. Also see the decrease in the rate of climb. Beware of short fields, gross loads and high temperatures.

Remember the old adage, "An ounce of prevention. . . ." This might work for you to prevent an accident.

This will be my final article for the MAC newsletter. I have been transferred to Milwaukee and will be leaving Billings between June 1 and 15. I want to thank the people of Montana for making my stay both enjoyable and productive. I have received nothing but complete cooperation from the flying public. I believe that, with your help, we have decreased accidents. You can be sure that my family and I will always remember the people of Montana.

Keep your flying safe and have many happy landings!

Films Available From the MAC

On a Free Loan Basis

The following films are all 16mm sound films. In order to insure receiving the films on a date convenient to you, please select a first and second choice for showing dates and request them 2 weeks in advance.

MONTANA AND THE SKY is a film about a big State and how its people use the airplane in the development of a modern frontier. In Color. Running time: 17 minutes.

AGRICULTURAL AVIATION shows uses of the airplane in spraying and cropdusting. In Color. Running time: 13 minutes.

AIRPORT AMERICA shows the importance of the airport to the community. In Color. Running time: 13 minutes.

FLIGHT DECISION presents

some of the problems of a pilot in regard to weather. In Color. Running time: 14 Minutes.

TO SAVE A LIFE shows an emergency procedure for pilots who inadvertently fly into bad weather. In Color. Running time: 14 minutes.

MAN IN SPACE is a Walt Disney film showing many of the aspects of space travel. In Color. Running time: 28 minutes.

FLYING FARMER shows the use of a Flying Farmer lighted airport on a typical ranch. In Color. Running time: 10 to 12 minutes.

AVIATION AND THE STATES shows the functions of State Aviation Agencies. In color. Running time: 20 minutes.

AIR TAXI, U.S.A. depicts the uses of Air Taxi services, supplementing commercial airlines. In Color. Running time: 15 minutes.

ROAD TO THE STARS is a documentary film on the development of the rocket in Germany and the United States. In Color. Running time: 28 minutes.

TAKE THE HIGH ROAD explains the use of aeronautical maps for pilotage, and is the story of a trip taken by a grade school youngster with Carl Guell of Madison, Wisconsin. In Color. Running time: 15 minutes.

WE SAW IT HAPPEN is a documentary of 50 years of flight and features some of Aviation's Great Names. In Black and White. Running time: 58 minutes.

The film will be shipped to you via prepaid parcel post and you have only to pay the return postage. It will be appreciated if you would return the film the day after you have shown it so that other persons may enjoy previously arranged schedules.

After showing, please rewind the film and report any breakage or maintenance needs.

Note: To Out-of-State interested parties: The film "Montana and the Sky" is now available for out-of-state viewing.

FOR SALE: Stinson 150 Voyager—536 TT since new. Sold with a new periodic. Primary Blind Panel. Super-homer and G E Transiever. Fabric tests like new. Cream-Puff condition. Price \$3200. Timm Aero Service, Polson—Phone 883-2813.

Effects of Sonic Boom on Light Aircraft, Helicopters Investigated

A test program to explore sonic boom hazard to light aircraft and helicopters has been conducted at Edwards AFB, California, by the Federal Aviation Agency, the National Aeronautics and Space Administration and the Department of Defense. The program ran from February 18 through 27. Potential dangers of structural damage to aircraft and other safety-of-flight factors were investigated.

The light aircraft and helicopters were subjected to sonic booms while on the ground, in cruising flight, in turning flight and near stall configuration in the case of fixed wing craft. The light aircraft were a Piper PA-22 Colt, a Piper PA-23 Apache, a Piper PA-24 Comanche, and a Beech C-45. Helicopters manufactured by Hiller, Bell and Vertol were used.

The booms were generated by Air Force F-104, F-106, and T-38 supersonic jets. These aircraft produced booms of varying intensities on the light aircraft and helicopters by varying speed and distance from them as they performed supersonic fly-by runs. The light aircraft and helicopters received thorough structural inspections before and after each sonic boom run. The test aircraft were instrumented with accelerometers and automatic cameras to provide in-flight test data on boom effect. Observers flew with the light aircraft and helicopter pilots to watch for specific psychological and physiological reactions.

A Sonic Boom is a Strong Pressure Wave Through the Air Created by an Aircraft Moving at or Above the Speed of Sound. The boom propagates from the plane much as ripples emanate from a rock thrown into a still pond. Boom strength is measured in pounds per square foot of overpressure, or pressure above the normal air pressure of the earth's atmosphere at sea level.

The strength of this shock wave when it reaches the surface

of the earth, or an airborne aircraft above the surface of the earth is dependent on a number of variables, which include the speed, size, geometry, and weight of the generating aircraft; its distance from the earth's surface, and atmospheric and wind conditions. Some flight maneuvers conducted by generating aircraft also increase pressure waves; a sharply turning aircraft, for example sets up a higher pressure than one flying straight and level.

The sonic wave, dependent on these variables, can range in noise level from inaudible to the true "boom" proportions of a thunder-clap or an artillery piece. Effects on ground structures from sonic booms appear to vary along a broad scale — from no effect in most instances to vibration or, in a small number of cases with certain materials, incipient damage.

A report on this test work will be prepared later this year following analysis and evaluation of data.

FOR SALE: DuKane Projector. Sanderson Private Course. AOPA 360 degree Course. \$500.00. Inquire Box 1698, Helena, Montana.

Light Aircraft Icing Program

A \$50,000 contract to conduct an engineering study of the technical requirements for icing protection systems for light aircraft has been awarded to General Dynamics/Convair, San Diego, California, by the Federal Aviation Agency.

The contractor will examine available data on icing cloud characteristics, factors in aircraft icing, the nature of aircraft ice, methods of aircraft ice detection, and current and possible future ice protection systems. Also examined will be cockpit control of these systems and ways to provide icing protection matched to the varying needs of different types of light aircraft.

All pertinent data will be prepared in the form of a manual for the use of aircraft manufacturers.

The contract will run for six months.

need for additional services for pilots flying under Visual Flight Rules.

More than one-tenth of the money, approximately \$12,500,000, is programmed as follows for airport traffic control towers:

A total of \$3,000,000 is for relocation of towers at eight locations where improvements at the airport make it essential that a new site be obtained or where it is impossible to expand the existing facility to provide for new and additional electronic equipment required at these locations.

The remaining \$9,500,000 will be used for construction of control towers by the FAA and for establishment of air traffic control services at locations which recently qualified for this service in accordance with the FAA criteria of 24,000 itinerant operations in a 12-month period.

This is the initial program undertaken by the FAA to construct towers since Congress excluded the construction of tower structures as an eligible item under the Federal-Aid Airport Program.

Construction of free standing towers at large airports will be in accordance with the new FAA standard tower design. This design will meet the airport needs and can be expanded to keep pace with increased airport activities and traffic control requirements.

Additionally, under the \$113.1 million Fiscal 1963 program, radar information from seven military radar sites and one FAA radar site will be remoted to appropriate Air Route Traffic Control Centers to eliminate present radar gaps, and to provide expanded coverage for efficient radar air traffic control at an average cost of \$496,333.

For the first time, Weather Bureau radar information will be extended to 19 airport traffic control towers, at a cost of \$34,700 each. The weather radar data will enable controllers to route airplanes around potentially dangerous weather conditions.

Thirteen long range radar locations will receive new, improved radar antenna reflectors at an average unit cost of \$121,923. These reflectors help reduce ground clutter on the radar scope

and improve high altitude coverage consistent with air traffic control needs. Because of antenna size—50 feet in width—radomes are required to protect them from wind, snow and ice.

Air Traffic Control Radar Beacon Systems (ATCRBS) will be installed in 28 control towers as a secondary radar system associated with Airport Surveillance Radars (ASR), costing an average of \$174,220 each. The beacons, employing 64 codes which may be assigned by controllers to aircraft, will provide identification of radar targets on the ASR scopes and reinforce target signals. These are two features lacking in the primary ASR system. The current program provides ATCRBS equipment for all currently programmed ASR facilities. Installation of airborne beacon equipment is the responsibility of aircraft operators.

Video Mapping Equipment at \$20,000 per unit will be provided for use with 65 long range radar display systems in Air Route Traffic Control Centers in connection with handling high altitude air traffic. For simultaneous display with radar target information, video mapping is an electronic method of showing airway structure, restricted zones, geographical fixes, and other map data needed for high altitude positive air traffic control.

Funds are provided in the fiscal '63 program for building expansion and equipment rearrangement at twelve Flight Service Stations, costing an average of \$81,075 at each location. The Flight Service Station expansion is a result of increasing general aviation flying — an estimated 13.3 million hours in 1962, expected to grow to 17.1 million hours by 1968 — and the resultant increase in flight following service and other assistance provided for general aviation pilots.

Completing a program started in Fiscal Year 1961, 113 Flight Service Stations, combined Station/Towers, and non-radar towers will be equipped with VHF-UHF Direction Finding Equipment to Render Service to both VHF equipped civil airplanes and

UHF equipped military aircraft. This equipment is used primarily to assist pilots who are lost or uncertain of their position. It enables air traffic personnel to orient or assist distressed pilots to a safe landing. The VHF/UHF direction finding equipment, by electronically measuring the bearing of radio signals from the aircraft, establishes its direction from the station. Each unit will cost approximately \$28,340.

The fiscal '63 program calls for a continuation in the establishment of VORTAC facilities costing \$337,900 each. VORTAC is the standard en route short range air navigation aid for all users. It provides pilots of equipped airplanes with bearing information as well as distance to and from the facility. A detailed review is being made of the airway requirements to insure that full consideration is given to all needs and that there is sufficient justification for the installation of each facility. The new needs being considered include: airways or routes, dual, multiple and by-pass airways or routes; improved signal coverage along existing routes; segregation of military training activities; terminal operation, including instrument approach procedures, departure procedures and terminal routings; and stratification of airspace.

Fifty very high frequency omnidirectional radio ranges (VOR) will be converted to VORTAC stations at a cost of \$237,900 each. This will add ultra high frequency direction and distance measuring capability to the facility in conformance with the international standard for en route short range air navigation aids.

Partial Instrument Landing Systems (ILS) which include components such as localizers, outer markers and compass locators costing approximately \$162,335 for each system will be established at four locations to facilitate air traffic movements and increase safety of approaches. These locations are those which do not qualify for a full ILS and where installation of a terminal VOR would not be feasible.

Six ILS backcourse compass locators will be established at five

airports—each costing \$36,333—to provide an ILS backcourse approach and departure procedure and an additional aid for terminal air traffic control procedures.

FAA will install Waveguide Localizers to existing ILS systems at 11 locations at unit costs of \$176,642. Waveguide Localizers are ILS components required for locations where conventional localizers provide marginal or unsatisfactory course direction caused by reflections and/or reradiation from surrounding terrain or structures.

Montana will receive High Altitude Video Mapping Equipment at Great Falls Air Route Traffic Control Center.

Flight Service Stations quarters will be expanded and equipment rearranged at the Lewistown Flight Service Station.

The Great Falls, Helena, Livingston, Butte and Dillon Flight Service Stations will be equipped with VHF/UHF direction finding equipment.

Existing VORs will be converted to VORTAC facilities at Lewistown and Whitehall.

NOTE: Locations of listed facilities are subject to revisions as detailed surveys are conducted and local conditions are more firmly determined.

FOR SALE: Piper PA-12—115 Lycoming—530 TT. 250 on majored engine. Ship like new; recent recover, new upholstery. \$2350 for quick sale. Timm Aero Service, Polson — Phone 883-2813.

Openings for Registration In Airframes, Powerplants And Electronics Courses

The department of Aeronautics and Related Trades of the Helena Senior High School will have openings for registration of a limited number of boys in the Airframes, Powerplants and Electronics Courses for the 1963-64 school year. These courses are open to all Montana residents and, since the passage of House Bill 346, there is no tuition charge for students under 21 years of age. Each course requires 960 hours of classroom and shop work. Upon completion the students are quali-

fied to pass the Federal Aviation Agency examinations for the Airframes or Powerplants licenses.

A student must apply to his County Superintendent of Schools before June 1st for a transfer of funds in order to register September 1st.

This applies only to Montana Resident Students.

Tuition for adults is \$400.00 for each 9-months period.
Principal, Dept. of Aeronautics & Related Trades
Helena Public Schools
2300 East Poplar, Helena.

Flyers' Calendar

MAY 19—FLY IN AND FISH

at the Tiber Airstrip, Tiber Recreational Area. Breakfast available. Prizes will be awarded to men, women and children at the Fish Derby.

Bring Tie-Downs. Sponsored by C. P. Bakke Post 3997, VFW — Chester, Montana.

MAY 24-25-26—Montana Pilots Annual Convention—Helena.

JUNE 2 — Montana Flying Farmers and Ranchers Fly-In.

Laughus Ranch near Big Timber. Pot Luck lunch. Crowning of new Queen.

JUNE 21-22-23 — Montana Pilots Association Air Tour of Montana. Details in MPA President's article.

JUNE 23 — Reunion of 1961 Alaskan Air Tour participants. Time 8:00 a.m. to 2:00 p.m. Breakfast. Anderson ranch eight miles north of Rudyard. On the Montana Aeronautical Chart as (Anderson) straight north of Rudyard.

Unicom will be available at the ranch (122.8). Terry Anderson.

JULY 14 — Idaho Centennial Air Show—Boise, Idaho.

MAY 14-15-16, 1964—Intercollegiate Flying Clubs Annual Meet. Belgrade, Montana.

FOR SALE: Aeronca Champ parts—wings, struts, fuselage parts. Timm Aero Service, Polson. Phone 883-2813.

FOR SALE: Mooney M20A 1960 T T A & E—1060 hrs TSMOH, 88 hrs FGP MK2 & LF Heated Pitot, showroom condition, \$10,900 trades accepted 4 1/2 financing. Call or write Willy Rimby, Skycraft, Lewistown. Phone 538-5457 or 538-9448.

TURBULENCE

R. A. DIGHTMAN

State Aviation Liaison Official
WBAS, Helena

HARRY L. ELSER

Quality Control Officer
WBAS, Great Falls

Because it is one of the more commonly encountered elements of aviation weather, it is hardly surprising that turbulence is a common subject for discussion when groups of pilots and meteorologists get together. Sometimes these discussions seem to involve controversy, but this is more apparent than real. Actually much of the discussion, at such times, arises from the exceedingly complex character of turbulence itself, from attempts to classify turbulence in relatively simple terms, from varying degrees of pilot experience with "rough" air, and (perhaps as important as any) some degree of misunderstanding of definitions, the physical nature of turbulence, etc.

It is not surprising that "turbulence" has different meanings to different people. To many pilots the definition is simply "rough air" which produces other than a "smooth" ride for his aircraft. To a physicist the definition becomes exceedingly difficult, as attested by the fact that definitions appearing in most texts of Physics or Meteorology almost always involve very complex and practically unsolvable mathematical expressions. In "Glossary of Meteorology" turbulence is defined: "A state of fluid flow in which the instantaneous velocities exhibit irregular and apparently random fluctuations so that in practice only statistical properties can be recognized and subjected to analysis. The situation is, in fact, analogous to that accepted unreservedly in the field of molecular physics. These fluctuations often constitute major deformations of the flow and are capable of transporting momentum, energy, and SUSPENDED MATTER at rates far in excess of the rate of transport by the molecular processes of diffusion and conduction in a non-turbulent or laminar flow. The satisfactory treatment of this phenomenon in

the atmosphere is perhaps the outstanding unsolved problem of theoretical meteorology." In this definition the words **SUSPENDED MATTER** should be noted, because this is where aircraft (actually "suspended" in the air although moving) are involved.

If the definition sounds complex, don't blame anything but turbulence itself. It is an exceedingly complex phenomenon. Perhaps the best analogy available, which can actually be seen, is that of one of our Montana rivers. Where the stream is straight and smooth the water flows steadily and quickly with the a minimum of disturbance. Find a stretch on the same river with the same rate of fall, but with boulders on the bottom, or with changes in channel shape, etc., and the flow is no longer smooth; it is slower in places and faster in others, it has rolling eddy motions in all directions—the flow is turbulent. This is what happens when winds of any speeds flow over or around our mountains, across or up and down our winding mountain valleys or on a smaller scale, near the surface, where the wind flow

passes over and around groups of buildings, clusters of trees, etc. This is the mechanical turbulence most commonly encountered in Montana, a problem most of the time rather easily handled by pilots who know what causes this type of rough air and know both how to avoid the leeside turbulent areas, and how to get out once caught in them. This type of turbulence is strongest, and has largest vertical and lateral extent, when winds are strongest. The surface wind-mechanical turbulence relationship is direct, and can be very useful in flight planning.

Other important causes of turbulence include "convection", or uneven heating of the air near the surface which in turn can produce upward motion of heated air, followed by lateral air movement to replace the lifted air, and in many cases by downward motion adjacent to the site of maximum heating. Process is involved in the often encountered roughness around lakes and reservoirs—descending air over the water during the day (cool surface) and rising air over the surrounding

shore line. Or watch a kettle of water as it starts to boil on an electric range. The hottest water rises in the center of the kettle, while it descends around the circumference after undergoing slight cooling (evaporation, etc.). The same process in more pronounced form is found in cumulus clouds, and becomes strongest in thunderstorms where upward motions as strong as 80 ft. per second (54 m.p.h.) have been found. Downdrafts usually are not that strong, but imagine the "bump" one would feel if he were to fly through a 30 m.p.h. downdraft into an immediately adjacent 50 m.p.h. updraft. This possibility of extreme turbulence is the primary reason why thunderstorm cells are good things to avoid!

Other types of turbulence involve wind "shear" between adjacent currents of differing speeds, often found in frontal zones, nearly always found at boundaries of the jet stream, as well as above surface inversions. For example, suppose that airport winds are light on a clear, cool morning: after ascending through the cool surface layer, some roughness

FOR CURRENT-TRANSPORT-AIRCRAFT

Turbulence	Transport Aircraft Operational Criteria	Air Speed Fluctuation	Gust Criteria (Derived Gust Velocities)
Light	A turbulent condition during which occupants may be required to use seat belts, but objects in the airplane remain at rest.	5 to 15 knots	5 fps to 20 fps
Moderate	A turbulent condition in which occupants require seat belts and occasionally are thrown against the belt. Unsecured objects in the aircraft move about.	15 to 25 knots	20 fps to 35 fps
Severe	A turbulent condition in which the aircraft momentarily may be out of control. Occupants are thrown violently against the belt and back into the seat. Objects not secured in the aircraft are tossed about.	More than 25 knots	35 fps to 50 fps
Extreme	A rarely encountered turbulent condition in which the aircraft is violently tossed about, and is practically impossible to control. May cause structural damage.	rapid fluctuations in excess of 25 knots	More than 50 fps

Aircraft turbulence criteria developed by NACA subcommittee on Meteorological Problems (May, 1957). Terms apply to aircraft of about DC-3 category or heavier, and other users should evaluate them in the light of their own operational limitations.

can be expected in the zone between the relatively calm surface layer and the level where free wind motion is found.

Any combination of these factors can produce turbulence, making it a little more understandable why a simple absolute scale for defining degrees of air "roughness" has not been possible to develop. Further complicating the picture is the fact that roughness as felt by a pilot depends upon type of aircraft, its air speed, its wing loading, pilot's flight techniques, and even to some degree on the extent of the pilot's experience. Now, recognizing that turbulence, being an amazingly complex phenomenon physically, is so extremely difficult to measure (or even estimate) the difficulty of forecasting it accurately may be appreciated a little better — especially when it is remembered that good forecasts are more achievable when there are "accurate" observations of the phenomenon being forecast.

With the above background the difficulty in reducing turbulence reporting and forecasting to a common simple terminology can be better understood. In 1957 the NACA Subcommittee on Meteorological Problems developed some aircraft turbulence criteria primarily for craft of the DC-3 category or heavier. With full knowledge that it is not the final answer, the NACA turbulence table is the one in current use for both reporting and forecasting that phenomenon. That table is reproduced for reference, and the Montana Aeronautics Commission is planning to print a card carrying the table for convenient insertion in wallets, flight plan kits, etc. The card will be available to all registered pilots. Bearing in mind the limitations of the system, it is hoped that this discussion will permit a more understanding use of its terms and descriptions by both pilots and forecasters. Pilot reports of turbulence are a vital step in relaying information about it to other pilots, flight planners, briefers, and forecasters. Careful use of the card in reporting the degree of roughness will go a long

way in improving the quality of turbulence information, both current and forecast.

FOR SALE: J-3 Cub 65 hp 200 hr. SMOH. Rec. Tach. 13 gal. aux. tank. Recent periodic. Clean and ready to go. \$1350.00. Call or Write Willy Rimby, Skycraft, Lewistown. Phone 538-5457 or 538-9448.

FAA Reports Air Traffic Figures

Increases in general aviation flying during 1962 accounted for the highest total air traffic figure ever recorded by the Federal Aviation Agency — 28,201,000 landings and takeoffs at 270 airports served by FAA control towers.

The tower at Chicago's O'Hare International Airport was the nation's busiest, handling a total of 417,380 landings and take-offs, about 99,000 more than 1961.

Terminal and en route data are presented in the publication, **FAA AIR TRAFFIC ACTIVITY, Calendar Year 1962**. The year brought an increase of 16 airports over the 254 of 1961 equipped with FAA-operated towers.

Aircraft operations in 1962 were seven percent higher than the 26,301,000 total for 1961. (An operation is either a landing or a takeoff.)

General aviation flying increased from 12,129,000 operations in 1957 to 17,367,000 in 1962. For the same period, airline flying declined from 7,112,000 to 7,060,000 operations. This decrease in air carrier operations is attributed mainly to the declining use of piston aircraft as more jets enter service with their greater passenger-carrying capacity.

Although the airlines account for 57 percent of all instrument approaches made in 1962, general aviation instrument flying has grown steadily from slightly less than 6 per cent in 1953 to approximately 18 percent in 1962.

FAA Flight Service Stations were 4.7 percent busier in 1962 than in the previous years with 86 percent of the 7,303,000 aircraft contacted flying under Visual Flight Rules (VFR).

Chicago O'Hare's 417,380 operations pushed last year's leader, Los Angeles International Airport, into second place in 1962 with 344,053 operations. Chicago Midway Airport, once the perennial leader in total operations, ranked 97th with 107,746 operations. O'Hare also had more itinerant, airline and instrument operations than any other airport in the country.

Van Nuys Airport in California retained its lead of last year in general aviation itinerant operations with 141,983 takeoffs and landings. In total operations, which includes local operations such as training flight, Van Nuys ranked third behind O'Hare and Los Angeles International, with 320,994 landings and takeoffs.

The year also brought an increase of 16 additional airports. Following are the rank order listings of Montana airports in terms of operational categories.

TOTAL AIRCRAFT OPERATIONS:

	1962	
Great Falls	106 with	106087
Billings	135 with	92492
Missoula	245 with	33211
Helena	248 with	31388

ITINERANT AIRCRAFT OPERATIONS: 1962

Great Falls	103 with	68473
Billings	130 with	58611
Helena	247 with	22242
Missoula	253 with	20062

AIR CARRIER OPERATIONS: 1962

Great Falls	103 with	17879
Billings	119 with	15299
Missoula	222 with	3450
Helena	227 with	3028

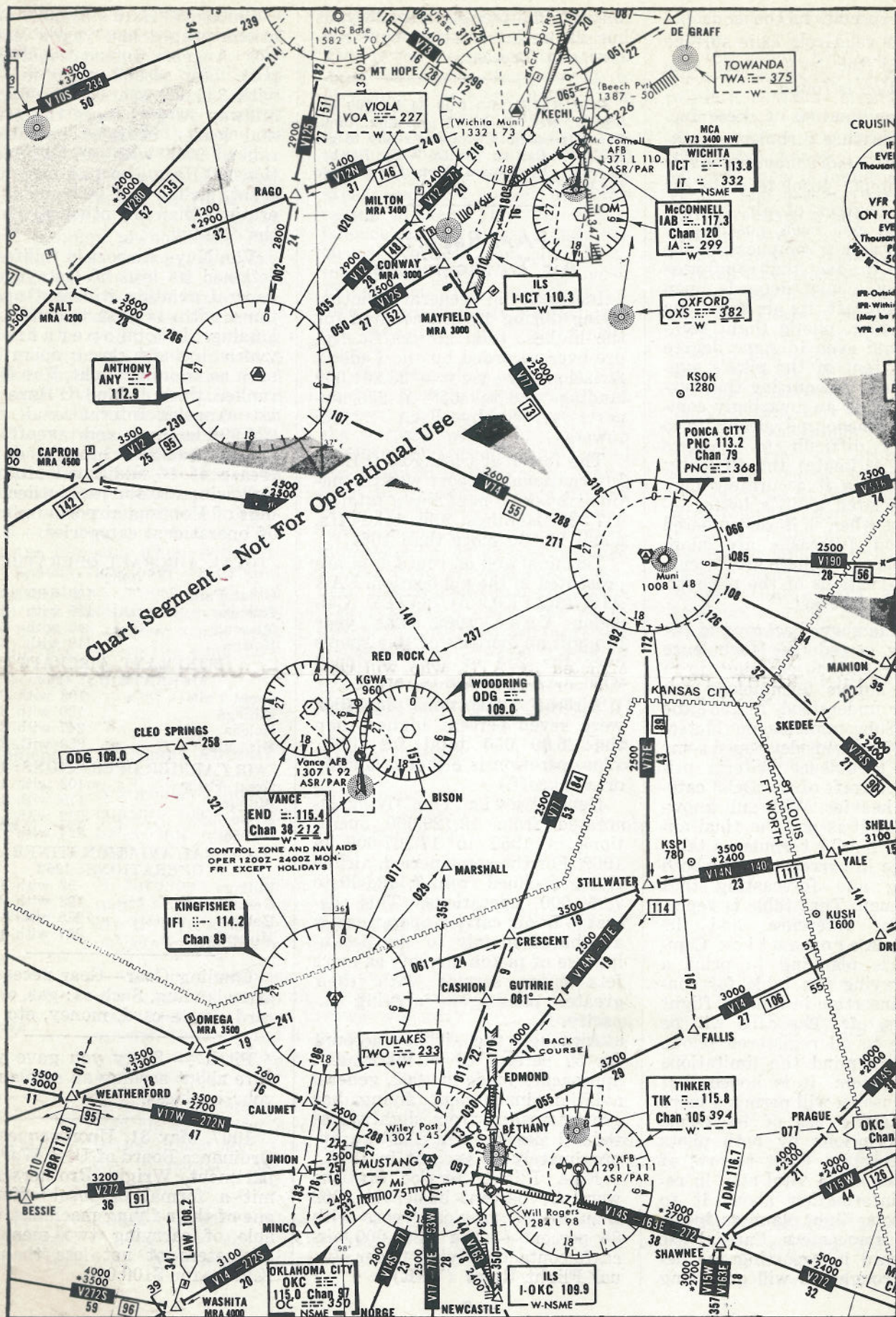
GENERAL AVIATION ITINERANT OPERATIONS: 1962

Billings	92 with	42044
Great Falls	98 with	39922
Helena	223 with	17203
Missoula	227 with	16235

Landing Gear—Gear necessary after landing. Such as: gas, credit card, Hertz card, money, etc.

Pitch — Story you gave your wife about needing an airplane in your business.

1907, May 31. Upon request of Ordinance Board of U. S. War Department, Wright Brothers submit a formal proposal offering one of their flying machines, capable of carrying two men 200 kilometers at not less than 50 K.P.H., for \$100,000.



Prepared by - FAA Operations Airman Examination Section
621 N. Robinson, Oklahoma City, Oklahoma

Exam-O-Gram No. 3 INSTRUMENT PILOT

Applicants for the Instrument Pilot Written Examination should be familiar with the current regulations relating to two-way communications failure. The regulations and procedures are given in Section 60.49 of Part 60 and are detailed in the Flight Information Manual. You will be better prepared to deal with a communications malfunction if you study each of the procedures relating to route, altitude, approach, and holding, applying them to specific flight problems such as the one following:

SITUATION:—IFR flight plan from Will Rogers Airport, Oklahoma City, Oklahoma, to Wichita Municipal Airport, Wichita, Kansas, with the following altitude and route requested (see enroute chart segment below): 7000 OKC V77 ICT.

You acknowledge the following ATC clearance prior to takeoff: ATC CLEARS SLIPSTREAM 456 DELTA TO THE MAYFIELD INTERSECTION VIA V77, MAINTAIN 7000, TAKE OFF SOUTH, TURN RIGHT PROCEED DIRECT TO OKC VORTAC, CLIMB ON COURSE, CONTACT DEPARTURE CONTROL ON 119.3 AFTER TAKEOFF.

After takeoff you turn right toward the VORTAC, contact Departure Control, and are advised as follows: IN RADAR CONTACT, TURN LEFT TO 180°, MAINTAIN HEADING 180° FOR VECTOR TO V77.

You acknowledge the heading, start the turn, and receive the following transmission: 456 DELTA, REPLY NOT RECEIVED, IF YOU HEAR ME TURN RIGHT HEADING 210°, OVER.

You acknowledge the heading and turn to 210°. Departure Control calls again: 456 DELTA, TURN OBSERVED, UNDERSTAND TRANSMITTER MALFUNCTION, TRANSMIT 121.1 or 118.3 IF UNABLE, MAINTAIN 210°.

You check your electrical system and transmitter, but fail to establish two-way communications. Your communications and

navigational receivers are operating normally.

WHAT DOES ATC EXPECT YOU TO DO: What you should do will depend upon a variety of factors, including enroute and terminal weather, available ATC facilities, and navigational equipment available in the aircraft. Departure Control will expect you to proceed according to one of the following alternatives, and will notify Kansas City ARTCC of your transmitter failure and of your observed intentions.

1. If flying under VFR conditions, continue VFR and land as soon as practicable (see FIM for meaning of "practicable").

2. If flying under IFR conditions,

a. you will be offered a radar vector back to Will Rogers Airport, or

b. you can proceed directly to OKC VORTAC, then to Mayfield intersection according to ATC clearance. Start the descent from 7000 for an approach on the ICT localizer at flight planned ETA or actual arrival time at Mayfield, whichever is later — or as instructed by ATC, who will contact you on the enroute NAVAID frequency. With radar available at your destination, you can acknowledge ATC instructions or questions by executing heading changes as directed.

REFERENCES — CAR 60.2, 60.49; Flight Information Manual, Vol. 1—Consolidated Amendment No. 7 (3/30/62); ATC Procedures (7/1/62), formerly ATS-2-A, now AT P 7110.1A. Section 360ff.

Interested in a Scenic Summer Vacation Spot?

"The Idaho Department of Aeronautics is offering special service to all flying groups who are looking for scenic and recreational places to go this summer.

In addition to offering recommendations to individual aircraft inquiries, Idaho will offer flying groups of three to five aircraft or more, a selection of packaged, all-expense, tours. For groups of five or more aircraft, the Idaho Department will offer group suggestions to fit their interests as

well as prepare route-marked maps and arrange for an escort plane to join with, and arrange, all services enroute if so desired.

If you are seeking a flying vacation in one of the most scenic, untouched states in the nation—if you would like to vacation on airstrips scenically located and equipped with camping facilities for flyers only—send your inquiries to: Idaho Department of Aeronautics, 3103 Airport Way, Boise, Idaho."

Wing Span — Pilot with arms long enough to reach all the switches on a light twin.

If you are too busy to laugh—you are too busy.

When you make a right turn from the center lane, sir, you are probably just careless — and not really what the driver behind called you.

Just be sure you don't miss the boat while you're waiting for your ship to come in!

FOURTH GRADERS VIEW AVIATION

The following stories are the winners in an essay contest from the Grand Avenue School in Billings, Montana. Robert Kaufmann, Teacher.

THE VALUE OF AVIATION TO MONTANA

Bob Farmer

Aviation is very important to Montana. They mostly use airplanes for transportation in Montana. Montana also uses airplanes for business. Montana's most important use of the airplane is for crop spraying. Montana also uses them for looking for people and things and if they can't get to it by airplane they use a helicopter. On ranches, they sometimes use airplanes for rounding up cattle. The police use a helicopter or an airplane to search for law violators. They also use airplanes for airmail. The smoke-jumpers in Missoula use airplanes to jump out of when there are no roads to get to the forest fire. They use helicopters for laying telephone

poles. They use airfreight for items requiring quick delivery. They use ambulance planes for saving lives which are called mercy flights.

Aviation also supplies jobs in Montana. You could be a pilot, a co-pilot, or a stewardess. You also might repair airplanes, or work in the control tower. You could also be a ticket agent. You could be a radio operator or a flight engineer. You could also be a maintenance man for repair of airport equipment, such as the field lights and electrical equipment.

THE VALUE OF AVIATION TO MONTANA

Deborah Lea

Aviation is a new and better way to get around. A lot of people use airplanes to get around today. Sometimes farmers use it to spray crops and insects, they use it to spot strays. Airplanes save lives when people are lost in the forest they find them and then go after them. Men in the oil business use airplanes to go on trips that are far away because it is so much faster.

We use airplanes for men to save forests; we call them the smoke jumpers.

In Montana we have more airplanes for the number of people than any other state. Men use airplanes to plant fish in all the lakes, rivers, and streams.

Airplanes provide jobs for people such as pilots, stewardess, men who sell tickets, and for men who sell airplanes. It also gives jobs to airplane mechanics, people who take care of air strips, people who take care of air mail, air freight, and air baggage and people who provide food for air passengers. Airplanes also give jobs to weather forecasters and tower operators.

Aviation brings in lots of money to both Great Falls and Glasgow where Army airbases are located. Besides these there are missiles located in Montana. These give the additional value of protection from a foreign enemy.

But as for me I think the greatest value of aviation would be the fun and excitement of an airplane ride.

THE VALUE OF AVIATION TO MONTANA

Ben Ripley

Aviation in Montana is as important as the subway is to New York City. Aviation influences the lives of the people all over our state.

Montana is so big it ranks 4th in size in the United States. It is just the opposite in population. It is very thinly settled. Therefore commercial planes make few stops in our state. However, we have a need for very rapid and direct transportation. Private planes usually piloted by the owner are used a great deal.

One group that makes good use of aviation is the farmers and ranchers. Farmers use planes for crop dusting. They also use them in hunting for predatory beasts that kill their chickens and stock. Ranchers use planes to herd cattle and find rustlers.

Forest rangers use planes to spot fires and parachute smoke jumpers to stop them. They also use planes to spray forests to prevent tree diseases and kill insects.

The fish and game department uses planes for game counts and to plant fish in remote areas.

Many commercial companies such as oil companies use planes to a good advantage in Montana. Since this is a plains area they don't always need airstrips for landing.

A real important use for aviation is for emergencies. Many a person has been saved because airplanes were able to provide quick help.

We must not forget how important planes are to use in our defense. Jet streaks in the sky remind us every day of the power of our Air Force.

There are many more important uses of airplanes such as for sight-seeing. How nice it would be to have a bird's-eye view of Billings, Montana! If aviation keeps growing in importance maybe we can all have that chance.

Did You Know That . . . The conventional airline passenger seat consists of more than 500 parts.

AIRPORT NOTES



By JAMES H. MONGER

Chief, Airports Division

AUGUSTA: Construction will start the first week in May on a new VFR Airport for Augusta. The contract for this state-local project was awarded to Schye Construction of White Sulphur Springs. Construction cost on this airport will be \$14,850. It is expected that the airport will be completed by July 1. This airport will have one runway 4,000 feet in length and 100 feet in width and will be located one and one-half miles south of Augusta.

BOULDER: The Winslow Construction of Whitehall has been awarded the contract to construct a new VFR Airport at Boulder, Montana. The construction cost of this airport will be \$15,425. Construction started May 6th and it is expected that the airport will be ready for air traffic on July 1st. The airport is located between the town of Boulder and the Diamond S Ranch hotel. The airport will consist of one runway 4,000 feet in length by 75 feet in width with a parking tie down apron.

POLEBRIDGE: A contract has been awarded the Engebretson Gravel Company of Kalispell to construct a VFR Airport at Polebridge, Montana for the total construction cost of \$12,578.90. This airport is located on the McFarland Ranch which is located on the west boundary of Glacier Park 12 miles south of the Canadian border. The airport will consist of one runway with a stabilized turf surface. The runway will be 3,000 feet long and 100 feet in width and completion date is slated for the middle of June.

DILLON: On April 15th a contract was awarded for the construction of a new administration



Anaconda Airport under construction. Jim Monger and Ed Harrison.

building to be located on the Beaverhead County Airport at Dillon. This new building will be completed in September of 1963 and will have space available for a flight operator and airport manager, a waiting room, rest-rooms; and will house the Dillon Flight Service Station. The FAA has stated that the FSS will vacate their old units and move into the new Administration Building as soon as it is completed. The general contract was awarded to Dan Ivey Construction Company of Dillon, Montana for \$3,398.00. The Davis Electric Company of Dillon was awarded the electrical contract for \$12,668.00. The mechanical contract was awarded to Saltenberger Plumbing and Heating of Anaconda, Montana at a cost of \$10,545. Total cost of the building is estimated to be \$76,949.25. This is a state and local project.

HAVRE: On May 2nd, a contract will be awarded for the com-

plete reconstruction of the Havre City-County Airport. Total cost of this project is estimated to be approximately \$210,000. The Montana Aeronautics Commission has loaned the City-County Airport Board \$100,000 to aid in the financing of this local-state-federal project.

The Montana Aeronautics Commission is presently participating in 31 active airport projects in Montana. Some of these projects are now on the drawing board in the engineering stage and the others are under construction. These projects range in sizes from a \$12,000 state and local VFR project to a one and one-third million dollar local-state-federal project. While 31 airports will be under construction this summer, approximately 12 other airports will be doing engineering planning for a reconstruction program for the summer of 1964. The MAC will be involved in 43 projects or more over the two-year period. In addition to the above-

mentioned projects there will be this summer from 10 to 15 municipal airports improving their facilities one way or another ranging from new buildings to seal-coating a runway. These projects are being conducted solely through local funds. These locations are to be commended for their foresight and initiative.

ANACONDA AIRPORT: Anaconda, Montana is no longer the largest county seat west of the Mississippi River without an airport thanks to Mr. Edmond Harrison formerly of Santa Barbara, California. Mr. Harrison has recently completed the construction of a VFR Airport three miles north of Anaconda adjacent to State Highway No. 48.

Mr. Harrison was a building contractor in California and acquired a fond interest for flying about four years ago. He is a private pilot with an instrument rating and owns a Piper Comanche. He is a member of the AOPA and has stated he is anxious to join the Montana Pilot's Association. Mr. and Mrs. Harrison now make their home in Anaconda and they have two boys at home going to school, one boy in college and one boy in the Navy.

Edmond Harrison has stated that his privately owned airport will be opened to the public and he said his motel would cater especially to anyone flying in. His 4,100 ft. stabilized turf runway is now completed and ready for traffic and he is now devoting his time and efforts to his Sky Lodge which is a 10 unit Motel located between the runway and the highway. Also under construction now is a 40 ft. by 50 ft. steel hangar and gasoline pump facilities. Later this summer he will have rent-a-car service from the Motel along with a unicom radio and 80 and 100 octane fuel as well as tie down space. Mr. Harrison does not plan on offering any flight instruction or repair service in the immediate future. He has stated that he is going to allow a nearby flight operator to come to his airport to render these services whenever needed.

Congratulations, Mr. Harrison, for this superb aviation development.

WEST YELLOWSTONE AIRPORT: The Montana Board of Examiners and the Montana Aeronautics Commission have awarded the contract for the construction of the new West Yellowstone Airport to Burggraf Construction Company of Idaho Falls. The amount of this contract is \$920,495.12.

A separate contract will be awarded in the near future for the construction of the Terminal Building.

Construction on this Airport Project will start prior to June 1, 1963.

Congratulations!



CERTIFICATES ISSUED RECENTLY TO MONTANA FLYERS

Doyle, Patrick D., Turner—
Student
Gribb, Walter J., Great Falls—
Com. AMEL, Boeing 377 &
Instru.
Lair, Walter C., Fort Benton—
Flight Instructor
Poncelet, Eugene R., Great Falls
—Instrument added to Com.
ASMEL and Private-Glider
Pirrie, George A., Jr., Helena—
Student
Wegner, Robert W., Helena—
Student
Williams, James D., Great Falls
—Student
Woodruff, Daniel T., Bozeman—
Private
Brown, Owen W., Belgrade—
Private
Langhor, Don M., Bozeman—
Private
Kirkpatrick, Charles A., Bozeman
—Student
Dolan, Donald E., Bozeman—
Com. ASMEL, ASES
Sharpe, Thomas W., Malmstrom
AFB—Boeing 377, Instrument
Anderson, Joseph R., Choteau—
Student
Hamilton, Howard D., Whitefish
—Private

Colby, Robert D., Kalispell—
Private
Buckhouse, Kathleen C., Great
Falls—Private
Walden, Bill N., Great Falls—
Student
Iverson, Kenyon A., Havre—
Student
Coan, Eugene C., Great Falls—
Instrument
White, Bradley V., Townsend—
Private
Winters, Larry D., Ronan—
Student
Johanson, Ernest O., Missoula—
Student
Francisco, Anthony J., Townsend
—Student
Walter, Gene M., Malmstrom AFB
—Student
Rhone, John S., Kalispell—
Student
Dunlop, William E., Helena—
Student
Monger, James H., Helena—
Private
Wiles, William L., Missoula—
Flight Instructor—Rotorcraft
Bean, Richard H., Malmstrom
AFB—Student
Martin, Marian Evelyn, Cut Bank
—Student
Hebbelman, John H., Chinook—
Student
Smith, Billy L., Butte—Student
Konda, Anthony F., Butte—
Student
Damuth, Harry H., Logan—
Student
Battershell, Thomas M., Helena—
Student
Wildgruber, Ferinand F., Cut
Bank—Student
Jackson, William B., Great Falls
—Student
Reesing, Ernest O., Three Forks
—Student
Davis, Darwin L., Butte—Student
Constenius, John N., Whitefish—
Student
Liebig, Carl G., Marion—Student
Bruner, Raymond G., Livingston
—Student
Fuqua, Joe D., Helena—Student
Speacht, William H., Chinook—
Student
Liddle, Tom W., Chinook—
Student
Rice, John S., Great Falls—
Student
Glazier, Dean H., Malmstrom
AFB—Commercial and
Instrument

Capp, Richard C., Great Falls—
Com. AMEL & Rotorcraft-
Helicopter and Instrument
Skees, John R., Great Falls—
Student
Matuska, Thomas W., Malta—
Student
Fish, Bryce L., Missoula—
Student
Blomquist, Emmett E., Dillon—
Student
Hopkins, March E., Helena—
Student
Moody, Vernon L., Helena—
Private
McDaniel, Robert L., Great Falls
—Student
Markoff, Nick, Great Falls—
Student
Whitt, Sidney G., Kevin—
Student
Thompson, Terry L., Great Falls
—Student
Nicholas, Glen Wilbur, Dillon—
Private
Ewing, Robert E., Kalispell—
Private
Connelly, James W., Great Falls
—Commercial
Lorenz, Richard K., Great Falls—
Student
Emerson, Kenneth A., Butte—
Private
Wallace, George H., Butte—
Private
Tierney, Ray U., Great Falls—
Student
Skaw, Loren D., Cut Bank—
Student
Brutosky, Boyce A., Great Falls
—Student
Barker, Vernon D., Browning—
Student
Eng, Robert L., Helena—
Student
Boles, Lloyd L., Colorado—
Private
Slack, Jerry Lee, Kalispell—
Private
Cowger, Ronald I., Wyoming—
Private
Allen, Robert L., Jr., Bozeman—
Private
Truzzolino, John M., Butte—
Private
Molander, Richard E., Butte—
Private
Storer, Charles H., Butte—
Private
Tingey, Jack W., Bozeman—
Private
Evans, Lola M., Warm Springs—
Student

Nulton, John H., Great Falls—
Student
Conner, Delbert A., Darby—
Student
Adolphson, Gordon R., Great
Falls—Student
Mitchell, James A., Livingston—
Student

"Letters to the Director"

Dear Mr. Lynch:

The April edition of "Montana and the Sky" just received and I hasten to send hearty congratulations.

Your Montana Pilot Flight Plan is just about the best program we have ever seen to completely answer the problems and aims of the "Grass Roots" segment of the industry so vitally concerned about this phase of flying safety.

I am sure your plan will be copied by many other states.

Kind regards,
Harold R. Hansen
Farwest General Agency

* * *

Dear Sirs:

I would like to recommend the Commission's recent approval of the flight plan filing and closing assistance.

In flying into my father's ranch strip at Froid in northeastern Montana I could have made use of this new service on several occasions. It is usually possible to make use of the facilities of Williston Radio in this case but on occasion when ceilings are low, radio contact is impossible and it is under conditions like these and others that will make the new service, developed by MAC, a very valuable and much appreciated contribution to the benefit of Montana Pilots.

Larry M. Ostby
Bozeman, Montana

* * *

Dear Sirs:

On behalf of the staff and administration of Brockton High School I want to thank you very kindly for the use of your very exciting and interesting films. It is a real service that you of The Montana Aeronautics Commission are performing for the schools and groups of the state. . . .

Francis E. Dahl, Principal
Brockton School District No. 5

The following are excerpts from letters regarding the 1963 revision of the Montana Directory.

" . . . I think they (Montana Directories) are very fine and will be a lot of help."

Will Tiddy, Manager
United States Plywood Corp.
Polson

* * *

Dear Sirs:

"I received the booklet on Montana Airports. I will be able to put the booklet to good use and I know that information like this is appreciated by all Montana pilots. . . ."

A2C Lanny L. Anderson
Malmstrom AFB

* * *

Aeronautics Commission:

" . . . I am grateful for the directory you sent as it will be a great convenience."

Don M. Langohr, Jr.
Bozeman

* * *

Dear Sir:

"I wish to take this opportunity to thank you for the airport directory I received from you. . ."

Richard Cockrell
Galata, Montana

* * *

Dear Sirs:

"I received the new directory today in the mail. . . After looking the new directory over I can say "it's wonderful". Thanks a million! ! !"

Daniel W. Juhl
Pompeys Pillar

* * *

Dear Sirs:

" . . . After looking through the directory, I feel sure that it will be a convenient aid to my flying. Thank you very much for this service.

Daniel R. Biggerstaff
Bozeman

The following letter was recently received by the Director of the Montana Aeronautics Commission and we felt that it may be of interest to some of you. It is from Kerala State, S. India.

Dear Sir:

Some time back I had occasion to send you a Souvenir of this college and to make a request to you to help our boys who have completed their training in Aeronautical Engineering, to obtain some placement for them, for work as apprentice or as Junior mechanics with Aviation Industrialist, big or small in your area.

In the event of your not having received my Souvenir and my last letter please be kind enough to refer to me, when I shall be happy to forward to you the same. We have pleasure to inform you that some good people of America in the field of Aviation Industry has helped us and taken in our boys for work with them for stipulated periods. This is a great measure of co-operation. This intake of the boys has created a very strong bond of friendship between our two countries. We have our boys now working at M/s. Mooney Aircraft, United Airlines, Pan American World Airways, Alaska Airlines etc., and also with small base operators in America. Any reference you desire to have of the college and the boys can be had from Mr. W. W. Parkhill, Training Superintendent, M/s. United Airlines, Maintenance Base, San Francisco International Airport, California.

I wish to inform you that I will arrange the passage from India to destination for the boys, so much so, the intaking firm has no cost to bear. The boys are smart, well behaved and speak and write good English, most of them are under graduates with ages ranging from 19 to 23. The question of salary or remuneration is left entirely to the intaking Institution. The main point is that the boy gets a chance to work in America with Aviation Industrialists big or small, including small Air Taxi services or small base operators. When back in India he will get ready employment and will

also be in a position to obtain his Maintenance License in India.

I am aware of the general depression in Aviation Industry. But given your kind co-operation, I am sure you could easily persuade Aviation Industrialists in your area to take in one or two boys with them and if satisfied with their performance (of which I shall assure you) more boys may be given a chance to work in your great country.

Whilst writing this circular letter the anxious hearts of all my boys are turned towards you and it is ardently hoped you will do your best for us.

S. P. LUIZ, F.I.C.E.
Principal
Luiz Nagar
Chalakudy P. O.
Kerala State
S. India

1906—May 22. Patent No. 821,339 issued to Wright Brothers on a Flying Machine.

1917, May 12. American altitude record is broken by Capt. W. A. Robertson, Jr., military aviator, at the North Island Flying School when he reaches a height of 17,230 Ft.

1918, May 3. The first Municipal Airport in the U. S. is dedicated at Atlantic City, New Jersey.

1926, May 9. Lt. Comdr. Richard Byrd and Floyd Bennett fly over the North Pole in the trimotored Fokker "Josephine Ford" (named in honor of Edsel Ford's daughter).

1927, May 20-21. Charles A. Lindbergh makes the first non-stop flight from New York to

Paris, 3,610 miles in 33 hrs., 30 minutes, thereby winning the Orteig Prize of \$25,000.

1927, May 25. Lt. James H. Doolittle does an "outside loop", in an airplane; first time this feat has ever been accomplished.

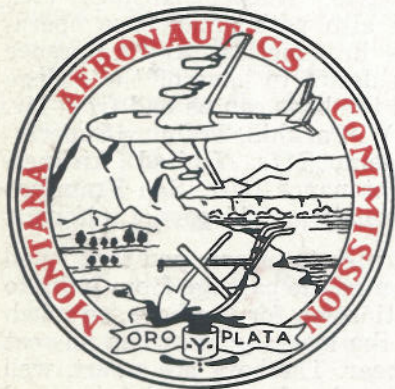
1932, May 20-21. Amelia Earhart Putnam makes solo flight across the Atlantic from St. Johns, New Brunswick, to Londonberry, Ireland, becoming the first woman to accomplish this feat.

Did You Know That . . . Three out of every five business aircraft in the United States visit the Miami area at least once a year.

Did You Know That . . . The first aerial application of agricultural chemicals occurred in Nevada in 1918.

MEMBER
NATIONAL ASSOCIATION OF STATE AVIATION OFFICIALS

PURPOSE:—"To foster aviation as an industry, as a mode of transportation for persons and property and as an arm of the national defense; to join with the Federal Government and other groups in research, development, and advancement of aviation; to develop uniform aviation laws and regulations; and to otherwise encourage co-operation and mutual aid among the several states."



P. O. Box 1698
Helena, Montana
Return Postage Guaranteed

U. S. POSTAGE
PAID
HELENA, MONT.
Permit No. 2